



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/930,880	08/15/2001	James F. Cameron	51166	1820

21874 7590 06/19/2003
EDWARDS & ANGELL, LLP
P.O. BOX 9169
BOSTON, MA 02209

EXAMINER

ASHTON, ROSEMARY E

ART UNIT	PAPER NUMBER
----------	--------------

1752

DATE MAILED: 06/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/930,880

Applicant(s)

CAMERON ET AL.

Examiner

Rosemary E. Ashton

Art Unit

1752

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 April 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 33-77 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 33-38, 42-57 and 61-74 is/are rejected.
- 7) ☒ Claim(s) 39-41, 58-60 and 75-77 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 33-37,44-46,48-56,63-65,67-73 are rejected under 35 U.S.C. 102(b) as being anticipated by Hayase et al U.S. patent no. 5,403,695.

Hayase teaches a positive photoresist composition comprising a phenolic polymer with acid labile groups, a photoacid generator and a carboxylic acid. The acid may be acetic acid or lactic acid (col. 4, lines 64-68 and col.5, specifically lines 5 and 28). The amount of acid is 0.5 to 20 wt % of the total solids (col. 6, lines 39-42). The solvent may be ethyl lactate (table 36 and col. 7, line 39).

The composition is coated on a silicon wafer, dried, exposed, heated and developed. The exposure wavelength is 193 nm using an ArF excimer laser (col. 10, lines 51-59).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1752

4. Claims 33-37,42-45,47,48-56,61-64,66-73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al U.S. patent no. 5,955,240.

As shown in the abstract Sato is directed to a chemically amplified positive working photoresist composition comprising a resin A, a photoacid generator B, an organic carboxylic acid C and an amine compound D.

Example 1 in col. 14 of Sato is shown below and exemplifies a chemically amplified positive working photoresist composition comprising a phenolic resin, a sulfonyl diazomethane photoacid generator, a basic compound of triethylamine, an organic carboxylic acid of salicylic acid and PGMEA as a solvent. The composition is coated on a silicon wafer, exposed and developed (example 1). The exposure may be done at 193nm using an ArF excimer laser (col.3, lines 1-8).

EXAMPLE 1

(11) 3 g of polyhydroxystyrene obtained in Production Example 1, in which 39 mol % of the hydroxyl groups had been substituted by tert-butoxycarbonyloxy groups, and 7 g of polyhydroxystyrene obtained in Production Example 2, in which 39 mol % of the hydroxyl groups had been substituted by ethoxyethoxy groups, 0.4 g of bis(cyclohexyl-sulfonyl)diazomethane, 0.1 g of bis(2,4-dimethylphenylsulfonyl)diazomethane, 0.2 g of pylogallol-trimesylate, 0.02 g of salicylic acid and 0.1 g of benzophenone were dissolved in 45 g of propylene glycol monomethyl ether acetate, and 0.03 g of triethylamine and 0.5 g of N,N-dimethylacetamide were dissolved in the resulting solution. The solution was filtered through a 0.2 .mu.m membrane filter to obtain a coating liquid of positive resist.

Sato teaches the acid may be acetic acid in col. 10, lines 43-66, specifically line 51 as well as salicylic acid (o-hydroxybenzoic acid) as shown in formula 32 in col. 11 and in col. 11, line 39.

Art Unit: 1752

The amount of acid is shown in col. 11, lines 62-68 and is 0.01 to 1% by wt as in applicant's claims 34-36.

The solvent may be ethyl lactate as in claim 48 as shown in col. 13, lines 9-25, specifically line 22.

It would have been obvious to one of ordinary skill in the art to use acetic acid in the photoresist composition, rather than salicyclic acid, with a reasonable expectation of obtaining a photoresist composition having high sensitivity and resolution with good storage stability because Sato teaches acetic acid and salicyclic acid are equivalent in the invention.

It also would have been obvious to one of ordinary skill in the art to use ethyl lactate as a solvent in the photoresist composition, rather than PGMEA, with a reasonable expectation of obtaining a photoresist composition having high sensitivity and resolution with good storage stability because Sato also teaches ethyl lactate and PGMEA are equivalent solvents in the invention.

5. Claims 38,57,74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al as applied to claims 33-37,42-45,47,48-56,61-64,66-73 above, and further in view of Oomori et al U.S. patent no. 6,387,587.

Sato does not teach the resin has phenolic groups and alkyl acrylate groups as in claims 38,57 and 74.

Oomori teaches a chemically amplified positive working photoresist composition comprising a resin, PAG, amine compound, organic carboxylic acid and solvent similar to the

Art Unit: 1752

composition of Sato. The polymer in Oomori consists of hydroxystyrene, styrene and alkyl acrylate monomers. As shown in example the resin is hydroxystyrene/styrene/t-butyl acrylate.

It would have been obvious to one of ordinary skill in the art to use the resin taught in Oomori having phenolic and alkyl acrylate groups in the photoresist composition of Sato wherein the resin has phenolic groups with a reasonable expectation of obtaining a photoresist composition having high sensitivity and resolution because the compositions of Sato and Oomori have the same reagents and thus there is a reasonable expectation the resins will provide the same advantageous effect to the photoresist composition.

Allowable Subject Matter

6. Claims 39-41,58-60,75-77 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter: The prior art does not teach a positive CAR comprising a resin, PAG and acetic acid or lactic acid wherein the resin is free of aromatic groups, the resin is a cyclic olefin and/or anhydride or that the resin a fluoro substituted.

Art Unit: 1752

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Koes teaches a negative photoresist composition comprising lactic acid (claim 5). Thackeray teaches a positive photoresist composition comprising a salt of lactic acid such as tetrabutylammonium lactate.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rosemary E. Ashton whose telephone number is 308-2057. The examiner works a flexible work schedule and can normally be reached M-F between 10:00 am and 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet Baxter can be reached on 308-2303. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Rosemary E. Ashton
Primary Examiner
Art Unit 1752

rea
June 14, 2003

ROSEMARY ASHTON
PRIMARY EXAMINER